



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Kathleen Clarke
Executive Director

Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210
PO Box 145801
Salt Lake City, Utah 84114-5801
801-538-5340
801-359-3940 (Fax)
801-538-7223 (TDD)

April 24, 2002

Mr. Darin Olsen
ECDC Environmental, LC
1111 West Highway 123
P. O. Box 69
East Carbon City, Utah 84520

Re: Compiled Mine Plan, ECDC Environmental, LC, ECDC Clay Mine, M/015/062, Emery County, Utah

Dear Mr. Olsen:

In 1999 and 2000, you made some revisions to the operation and reclamation plan for the ECDC Clay Mine that was originally approved in 1993. Because the changes could not be inserted directly into the existing plan, I have attempted to compile the operation and reclamation plans based on the information approved in 1993 as well as the newer submittals.

When I first started to make this compilation, I was unable to find the approved plan from 1993 and requested your help. You faxed me a copy of a plan from 1993, but I found that this plan did not correspond with the information we received in 1999 and 2000. After more thorough searching through our files, I was able to find a plan the Division received March 17, 1993, that matches the language in the later revisions. This plan has a green cover and says, "ECDC ENVIRONMENTAL; EAST CARBON DEVELOPMENT CORPORATION; Mine Site Plan for STATE OF UTAH DIVISION OF OIL, GAS AND MINING." I believe this was the approved plan, and I have based this compilation on that information.

The plan enclosed with this letter should be complete except that it does not include copies of photographs (Attachments C through G) or maps (Exhibits I through VI). I assume you have these, but please let me know if you do not.

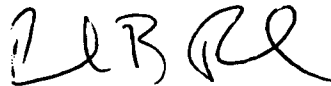
I have attempted to compile this information as accurately as possible and to make no changes, but, as noted in the document, I did make changes in references to the seed mixes. The text had reference to seed mixes A, B, and C, but I found two seed mixes labeled "A," one labeled "B," and none designated "C." I think the organization I have chosen is logical, but please let me know if you disagree.

Please review this information and let me know if you find errors. When a mine plan or amendment is approved, our current policy is to stamp it with the approval date and return a copy to the operator. Once we have agreed on a mine plan, I would like to stamp a copy and return it to you. This plan will then need to be kept current. Any future changes to the plan need to be done in a way that they

can be inserted directly into the plan. To facilitate this, I can provide you with an electronic version of the information I compiled. I can send this either on a disk or via electronic mail.

Please call me at 801-538-5261 or e-mail me at nrogm.pbaker@state.ut.us if you have any questions about this plan.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. B. Baker' with a stylized flourish at the end.

Paul B. Baker
Senior Reclamation Biologist

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Enclosure: Mine plan
P:\GROUPS\MINERALS\WP\M015-Emery\M0150062ECDC\final\ltr04242002.doc

Division of Oil, Gas and Mining
Notice of Intention to Revise Mining Operations
Compiled April 16, 2002

The following operation and reclamation plan is a compilation by the Division of Oil, Gas and Mining of a plan received by the Division March 17, 1993, together with revisions to that plan received in about March of 2000. The submittal received in 2000 only included the changes to the plan; it did not include the complete text. Thus, the need for this compilation was so the entire mine plan would be together in one document. In generating this document, the Division has been careful to make as few changes as possible to the text although there may be some very minor changes in formatting.

The Division did make some logical changes to the seed mixture designations. The operator's original submittal referenced seed mixes A, B, and C but only included seed mix A. A subsequent submittal included seed mixes A and B but no C. The text would indicate that seed mix A from the first submittal should be seed mix A and that seed mixes A and B from the second submittal should be B and C, respectively. The Division has made these changes.

III. Operation Plan (Rule R647-4096)

1. **Mineral(s) to be mined:** Bentonite clay.

2. **Acreage to be disturbed:**

Minesite (operating, storage, disposal areas, etc.):	29.6 acres
Access/haul roads/conveyors	3.2 acres
Associated on-site processing facilities	N/A
Total	32.8 acres

3. **Describe methods and procedures to be employed for mining, on-site processing and concurrent reclamation:**

The clay is present at or near the existing ground surface. It will be excavated with a D-9 dozer equipped with rippers and stockpiled. A 988 loader will load the stockpiled material into trucks which will haul the material to a crusher for processing. The crushed material will then be loaded and hauled to the ECDC landfill near East Carbon. Disturbed area reclamation will be on-going as a specific site is vacated. Revegetation will take place after the excavation and mining of the area is complete.

4. **Elevation of groundwater** (if known) not known
5. **Thickness of soil material to be stockpiled:** 2-8 inches
Area from which soil material can be salvaged: <5 acres
Volume of soil to be stockpiled: <4000 cubic yards
(cross reference with item IV-17)
6. **Thickness of overburden:** 4-6'
7. **Thickness of mineral deposit:** 1-100 feet
8. **Volume of refuse, tailing, and processing waste stockpiles:** N/A

9. **Acreage and capacity of tailings ponds and water storage ponds to be constructed:**

N/A

10. **Describe how topsoil or subsoil material will be removed, stockpiled and protected:**

As described in the soils section of this plan, little soil is available for salvage in the overall mining area. However, in areas proposed for future mining a small amount of topsoil will be salvaged. This amount is estimated to be between 2 and 8 inches depending on the area. All topsoil and subsoil available will be salvaged to the depth of the existing bedrock.

The salvaged soils will be stored in an area that does not interfere with current mining operations. This material will be stored until the time of final reclamation when it will be used for plant growth media.

11. **Describe how overburden material will be removed and stockpiled:**

Subsequent to removal of the existing topsoil, the overburden will also be removed. Overburden depths range from approximately 4 to 6 feet. This material will also be stockpiled and placed in an area that will not interfere with mining activities. After the clay is mined, the overburden material will be re-spread over the disturbed area prior to placement of existing topsoil material.

12. **Describe how tailings, waste rock, rejected materials, etc. will be disposed of:**

N/A

13. **Potentially deleterious materials must be analyzed for toxicity. Describe the nature of any deleterious materials which will be used, encountered, or generated onsite (See Rule R647-1-004):**

N/A

Specific analyses to be conducted on these materials:

NOTE: The Division may stipulate additional analyses.

14. **For each tailings pond, sediment pond, or other major drainage control structures, attach design drawings and typical cross sections.**

15. **Describe any proposed effluent discharge points (UPDES) and show their location on the map provided under Rule R647-4-105.2. Give the proposed discharge rate and expected water quality. Attach chemical analyses of such discharge if available.**

N/A

16. **Vegetation** – The operator is required to return the land to a useful condition and reestablish at least 70 percent of the premining vegetation ground cover.

The ground cover percentage figure is determined by sampling and averaging the vegetation type(s) on the areas to be mined (see Attachment I for suggested sampling methods).

Plant communities of the mine area and vicinity were dominated by Shadscale/Grass, Greasewood and Sagebrush/Grass. The Shadscale/Grass community comprised the most area. This community was dominated by shadscale (*Atriplex confertifolia*), winterfat (*Ceratoides lanata*), blue grama (*Bouteloua gracilis*) and Indian ricegrass (*Stipa hymenoides*). The Sagebrush/Grass community was dominated by black sagebrush (*Artemisia nova*), blue grama and Indian ricegrass. Though not located in the proposed new mining area the Greasewood community is adjacent to it and was probably present prior to previous mining activities. A general view of the plant communities can be viewed from the enclosed color photographs (Attachments A through C).

- (a) Vegetation Survey – The following information needs to be completed based upon the vegetation survey:

Sampling method used and number of plots or transects: Disturbed areas have previously been stripped of vegetation. Visual inspection as follows:

<u>Ground Cover</u>	<u>Percent</u>
Vegetation (perennial grass, forb and shrub cover)	20
Litter	
Rock/Rock Fragments	30
Bare Ground	<u>50</u> 100%
Revegetation Requirements (70 percent Of above vegetation figure)	14%

List the four (4) predominant perennial species of vegetation growing on the area.

- (b) Photographs – The operator may submit photographs (prints) of the site sufficient to show existing vegetation conditions. These photographs should show the general appearance and condition of the area to be affected and may be utilized for comparison upon reclamation of the site. Photographs should be clearly marked as to the location, orientation and the date tat the pictures were taken.

Photographs are submitted as Attachments C through G.

17. Soils – The plan shall include an order 3 Soil Survey (or similar) and map. The information is needed to determine which soils are suitable for stockpiling for revegetation. This soil data may be available from the local Soil Conservation Service office, or if on public lands, from the land

management agency. The map needs to be of such scale that soil types can be accurately determined on the ground (see Attachment I).

Although an Order I soil survey of the area has not been conducted, nor does the Soil Survey of Emery County include the area, the previously mined area in the bottomlands appears to be comprised of "Riverwash" soils as described by the Natural Resources Conservation Service (NRCS). Barely upslope from these soils appear to be "Ravola-Slickspots complex".

The area proposed for future mining seemed to be best described as "Persayo-Badland complex". The NRCS describes these soils as shown below.

This map unit is on dissected shall hills near Mounds Reef and East Carbon City. The present vegetation in most areas is mainly shadscale, prickly pear, galleta, winterfat, Indian ricegrass and blue grama. Slopes are 3 to 30 percent. Elevation is 5,300 to 5,400 feet. This unit is about 40 percent Persayo very cobbly clay loam; 3 to 15 percent slopes; 20 percent Badland; and 20 percent other soils. The Persayo loam is on hillslopes, the Persayo very cobbly clay loam is on summits, and Badland is along washes. The components of this unit are so intricately intermingled that it was no practical to map them separately at the scale used. Included in this unit are about 10 percent Killpack clay loam near washes, 5 percent Chipeta silty clay loam on ridges and 5 percent Rubbleland near sandstone ridges.

The Persayo loam is shallow and well drained. It formed in residuum and alluvium derived dominantly from marine shale and sandstone. Slopes are less than 100 feet long and are concave to convex. Typically, the surface layer is light brownish gray very cobbly clay loam 4 inches thick. The underlying material to a depth of 11 inches is light brownish gray silt clay loam over weathered shale. Depth to weathered shale ranges from 10 to 20 inches. A mantle of rock fragment is on the surface.

Badland is steep or very steep, nearly barren areas of shale that are dissected by many intermittent drainageways. Some areas are interbedded with sandstone. Runoff is rapid to very rapid, and geologic erosion is active.

18. **Provide a narrative description of the geology of the area and/or a geologic cross section:**
The geology in the area of the mine site consists of rocks in the Cretaceous Age. The soil profile consists mainly of shallow layer of Chipeta and Persayo soils over shale, mainly Mancos shale, and eroding shale outcrops.

IV. **IMPACT ASSESSMENT** (Rule R647-4-109)

Please provide a general narrative description identifying potential surface and/or subsurface impacts. Where applicable, this description should include surface and groundwater systems, threatened or endangered species or their critical habitats, existing soil resources for reclamation, slope stability, erosion control, air quality, and public health and safety.

This operation will not interfere with any surface or groundwater systems or any known threatened or endangered species or their critical habitats. The nature of the excavation and planned reclamation should

prevent any major erosion to the site. Slope stability will be controlled with slopes being limited to 2:1 or flatter. Dust control will be on-going to protect air-quality and OSHA standards will be followed to protect public health and safety. No pits or highwalls will be left at the site.

V. **RECLAMATION PLAN** (Rule R647-4-110)

1. **List current land use(s) other than mining:** Livestock grazing and wildlife habitat.
2. **List future post-reclamation land-use(s) proposed:** Livestock grazing and wildlife habitat.
3. **Describe each phase of reclamation of the minesite in detail under the following categories:**

(a) Disposal of Trash. Describe how buildings, foundations, trash and other waste materials will be disposed of:

All trash and foreign debris will be hauled away from the mine site and disposed of in existing waste landfills. No surface facilities of any type will be left on the site.

(b) Backfilling and Grading. Describe equipment and methods to be employed, amount of materials to be moved and final disposition of any stockpiled materials.

There are 3 areas delineated on maps for the reclamation plan including Uplands, Bottomlands, and Roads (see Exhibit IV). Upland areas will be backfilled to a slope angle of 2h:1v or less and graded to blend in with the natural surroundings. The Bottomlands will be graded to approximately 2 percent grade with runoff directed to the natural drainages of the Price River. The grading will also be done to blend in with the natural bottomlands common in the area. Finally, the Road areas will be reclaimed. The road cuts will be backfilled with existing fill materials. The roadways will be ripped to relieve soil compaction.

(c) Soil Material Replacement.

Once disturbed areas have been backfilled and graded, available onsite material will be placed on the Upland areas using dozers. First, the Upland areas that have been previously mined will be overlain with the overburden piles that exist on the site. (This material will be sampled in the near future to assess its suitability as a plant growth media—refer to "Other Revegetation Procedures" below). No topsoil material is available for this area. This material will be placed on the mine area in a "roughened" fashion to impede runoff, control erosion, and harvest natural precipitation for plant growth.

Subsequent to backfilling and grading during final reclamation activities in the Upland areas where future mining is to occur, the aforementioned stockpiles of overburden material and topsoil will be placed over them in the roughened fashion described above. Overburden material coverage at final reclamation is expected to be approximately 12 inches in depth. Due to limited amount of topsoil available for salvage, the topsoil coverage for final reclamation is expected to be 3 to 4 inches deep.

No topsoil or overburden material will be used for coverage at final reclamation for the Bottomland or Road areas.

(d) Seedbed Preparation

As mentioned above, the Upland areas will be left in a "roughened" condition to impede runoff, control erosion, and harvest natural precipitation for plant growth. Additionally, large rocks and boulders will be replaced on the seedbed. This also encourages micro-habitats, harvests water, and provides shade to enhance establishment of vegetation. The surface is not expected to be heavily compacted, but if it is compacted following placement of overburden material, it will be ripped to a depth of at least 6 inches prior to placement of any topsoil material. Because the Bottomland areas consist mostly of sandy material, seedbed preparations will include discing only. As mentioned previously, no topsoil is available and therefore planned for final reclamation.

The Road areas will be ripped to a depth of 6 inches following placement of existing road fill material.

(e) Seed Mixtures

Final revegetation will be accomplished using two seed mixtures. Seed Mix A will be used on the reclaimed Bottomland areas. Seed Mix B will be used on the Upland and Road areas.

Interim seeding of the topsoil stockpile will be done with Seed Mix C also shown below.

[Division note: The original submittal did not include a seed mix B. The March 15, 2000, submittal included seed mixes A and B. In this submittal, seed mix A was not labeled for use in a particular area, but the revision indicated seed mix B should be an interim mix. Logically, seed mix A from the original submittal should be used for bottomland areas, seed mix A from the March 15, 2000, submittal should be used for upland areas, and seed mix B from the March 15, 2000, would be used as an interim mix. This corresponds with the text, but these changes in designation were made by the Division and not the operator.]

Seed Mixture A

Bottomland Areas: Greasewood Community

SHRUBS	PLS/Acre	Seeds per sq. ft.
<i>Atriplex confertifolia</i>	4.0	5.88
<i>Ceratoides lanata</i>	6.0	7.58
<i>Chrysothamnus nauseosus</i>	0.5	4.59
<i>Sarcobatus vermiculatus</i>	1.0	6.57
FORBS		
<i>Helianthus annuus</i>	4.0	5.33
<i>Linum lewisii</i>	2.0	12.76
<i>Medicago sativa</i>	2.0	9.64
<i>Melilotus officinalis</i>	2.0	11.94

GRASSES

<i>Distichlis spicata</i>	0.5	5.97
<i>Elymus cinereus</i>	6.0	13.09
<i>Elymus lanceolatus</i>	4.0	14.14
<i>Elymus trachycaulus</i>	4.0	14.69
<i>Sporobolus airoides</i>	0.3	12.05
<i>Stipa hymenoides</i>	3.0	12.95

TOTALS	39.3	137.17
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Seed Mixture B

<u>Common Name</u>	<u>Species Name</u>	<u>*Rate lbs/ac (PLS)</u>
<i>Grasses:</i>		
'Hycrest' Crested Wheatgrass	<i>Agropyron cristatum 'hycrest'</i>	0.5
Intermediate Wheatgrass	<i>Agropyron intermedium</i>	2.0
Western Wheatgrass	<i>Agropyron smithii</i>	2.0
Indian Ricegrass	<i>Oryzopsis hymenoides</i>	2.0
Great Basin Wild Rye	<i>Elymus cinereus</i>	2.0
Alkali Sacaton	<i>Sporobolus airoides</i>	0.1
<i>Forbes:</i>		
Ladak Alfalfa	<i>Medicago sativa 'ladak'</i>	1.0
Yellow Sweet Clover	<i>Melilotus officinalis</i>	0.5
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5
<i>Shrubs:</i>		
Black Sage	<i>Artemisia nova</i>	0.2
4-Wing Saltbush	<i>Atriplex canescens</i>	1.0
Shadscale	<i>Atriplex confertifolia</i>	1.0
Winterfat	<i>Ceratoides lanata</i>	1.0
Rubber Rabbitbrush	<i>Chrysothamnus nauseosus</i>	0.5
Forage Kochia	<i>Kochia prostrata</i>	0.5

Seed Mixture C—Interim Mix

<u>Common Name</u>	<u>Species Name</u>	<u>*Rate lbs/ac (PLS)</u>
'Hycrest' Crested Wheatgrass	<i>Agropyron cristatum 'hycrest'</i>	1.0
Thickspike Wheatgrass	<i>Agropyron dasystachyum</i>	3.0
Newhy Grass	<i>Agropyron repens X A. spicatum</i>	3.0
Ladak Alfalfa	<i>Medicago sativa 'ladak'</i>	1.0
Yellow Sweet Clover	<i>Melilotus officinalis</i>	0.5

(f) Seeding Methods

Seeding will be done by broadcasting methods using hydroseeding equipment or standard dry broadcasting seeding equipment. Immediately after seeding, the areas will be hand-raked or chain-dragged to slightly cover the seed to a depth of about 0.25 inch.

(g) Fertilization

Soil sampling will be done once the seedbed is ready to be seeded. The sampling will provide information for application rates of fertilizer or other amendment necessary to enhance revegetation success. Fertilization will be accomplished prior to seeding in all areas.

(h) Other Revegetation Procedures

The entire area will be mulched. The sloped Upland areas will be mulched by a hydromulcher using fiber matrix (or equivalent material—at the rate recommended by the manufacturer) or by applying erosion control matting. Straw mulch will be crimped in the ground in the Bottomland and Road areas using standard farm and reclamation equipment at a rate of 2 tons per acre.

Soil sampling is planned in the near future on the existing overburden pile that is proposed to cover the 'current' disturbed Upland areas at the time of final reclamation. Parameters to be tested are listed below.

- pH
- Electrical Conductivity (EC)
- Saturation percent
- Texture
- Calcium carbonate equivalent percent
- Sodium adsorption ratio (SAR)
- Available water capacity (AWC)
- Organic matter
- Alkalinity
- CaCO_3
- Rock fragments

Prior to seeding the final seedbed will be sampled for the following parameters at the time of final reclamation.

- Electrical conductivity (EC)
- Texture
- pH
- Available phosphorous (P)
- Potassium (K)
- Total Nitrogen (N)

VI. VARIANCE

The operator is requesting a variance from rule number R647-4-111.12, Topsoil Redistribution. No topsoil was salvaged during the previous development of the site so none is currently available to redistribute on the disturbed area. The soil medium will be reconstructed in preparation for seed growth with virgin wood fiber and fertilizer.